

Isolated aortic valve repair using an external open ring annuloplasty

Emmanuel Lansac¹, Isabelle Di Cetta², Eric Arnaud Crozat³, Olivier Bouchot⁴, Fabien Doguet⁵, Jean- Noel Fabiani⁶, Tomas Daroca⁷, Jan Njis⁸, Roland De Maria⁹, Christophe Acar¹⁰, Mathieu Debauchez¹

OBJECTIVES: Current techniques for repair of isolated dystrophic aortic insufficiency (AI, sinuses of Valsalva <40 mm) associate treatment of cusp prolapse with reduction of dilated aortic annular base diameter. Despite encouraging mid-term results, lack of standardization limits their widespread use. We analyze preliminary outcomes of a standardized aortic valve repair procedure, combining resuspension of the cusp effective height with a subvalvular external aortic ring annuloplasty.

METHODS: The aorta is transected 1 cm above the sino-tubular junction. Aortic root is dissected externally down to the annular base, passing under the coronary arteries without detaching them from the aortic wall. Five "U" stitches are placed from inside out in the subvalvular plane, below each cusp nadirs and at each interleaflet triangles base except between the right and noncoronary sinuses to avoid injury to the bundle of His and membranous septum. Alignment of cusp free edges and resuspension of the cusp effective height are performed, correcting cusp prolapse by plicating central stitches until a 8-10 mm effective height is obtained. The "U" stitches are passed through inner aspect of the open subvalvular ring, in order that it may be positioned below the coronary arteries. The ring is closed and tight in subvalvular position.

RESULTS: 27 patients with isolated AI (8 bicuspid valves) were operated using this standardized approach by 9 surgeons (8 European centres). There were no operative deaths. Native aortic annulus was dilated in all cases (>25 mm). Second cardiopulmonary bypass for residual AI \geq grade 2 was necessary in 3 cases (2 successfully re-repaired, 1 valve replacement). Cusp repair was performed in 87.5% patients. Mean aortic rings diameter was 27.2 \pm 1.4 mm, producing significant reduction of native annular base diameter (- 23.2%, p<0.001). Mean coaptation height was 9 \pm 5.8 mm. There were no thromboembolic, hemorrhagic, endocarditis complications and no reoperations after a 30.6 \pm 24 (2-76) months mean follow-up. In all patients, aortic valve function, root diameters and aortic annular base reduction remained stable with low systolic gradient (6.9 \pm 5.5 mmHg).

CONCLUSIONS: These multicentre preliminary results show a low rate of valve-related complications after standardized approach to isolated AI repair using a subvalvular ring annuloplasty. Further prospective multicentre trials are needed to establish the best surgical strategy to treat isolated AI.